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Sociedad Argentina para el Estudio de los Mamíferos

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**First record of albinism in a cavy of the genus
Galea Meyen, 1832 (Rodentia: Caviidae)**

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Citación: ALMEIDA, A. K. R., F. HEBERSON MENEZES, & H. FERNANDES-FERREIRA. 2022. First record of albinism in a cavy of the genus *Galea* Meyen, 1832 (Rodentia: Caviidae). *Notas sobre Mamíferos Sudamericanos* 4:e22.3.3.

ABSTRACT

Despite numerous records of albinism in native populations, reports of this condition are still considered rare for mammals. Until this study, 113 cases distributed in 69 species and 15 families have been reported in Rodentia. Here we record the first case of albinism in the genus *Galea*, and the first national case in a Brazilian Caviidae species. An adult individual of *G. spixii* was photographed in a coastal region in Piauí state, northeastern Brazil. We discuss the survival of this specimen in an open and anthropized area, and the possibility of inbreeding in the population.

Key Words: Brazil, chromatic disorder, morphology, rodent, South America

RESUMO - Primeiro registro de albinismo em um preá do gênero *Galea* Meyen, 1832 (Rodentia: Caviidae). Neste trabalho, nós registramos o primeiro caso de albinismo em um preá do gênero *Galea*, é o primeiro caso de albinismo em uma espécie brasileira de Caviidae. Um indivíduo adulto de *G. spixii* foi fotografado em área litorânea do estado do Piauí, Nordeste do Brasil. Foi discutida a sobrevivência desse indivíduo albino numa área aberta e antropizada e a possibilidade de endogamia dentro dessa população.

Palavras-Chave: América do Sul, anomalia cromática, Brasil, morfologia, roedor

Albinism is a condition in which the individuals do not produce melanin, showing white hair, pink or white skin, and red eyes, and there is a variety of genetic causes of the different albinism conditions (Montoliu et al. 2014). Albino individuals are more susceptible to predation due to their greater visibility and difficulty in camouflaging (Simpson 1994; Steen & Sonerud 2012) and can suffer from physiological and visual problems (Searle 1990; Caro 2005; Montoliu et al. 2014; Romero et al. 2018). The

Recibido el 23 de agosto de 2021. Aceptado el 31 de enero de 2022. Editor asociado: Ricardo Ojeda.



combination of these negative factors reduces individual fitness, which explains the low occurrence of this phenotype in nature (Vasconcelos et al. 2017; Romero et al. 2018).

Despite the rarity of this condition in wild populations (Abreu et al. 2013, Romero et al. 2018), albinism has been reported in several groups of mammals such as bats (Rosa et al. 2017; do Nascimento et al. 2018; Leal & Ramalho 2021; Venterin et al. 2021), primates (Espinal et al. 2016), carnivores (Blaszczyk et al. 2007; Acevedo et al. 2009), artiodactyles (Veiga 1994), and xenarthrans (Xavier et al. 2010). For rodents, there are 113 cases distributed in 69 species and 15 families around the world (e.g., Csandy 2017; Romero et al. 2018; Ramirez et al. 2019; Stumpp et al. 2019; Dalapicolla et al. 2020; Garca-Casimiro & Santos-Moreno 2020; Nations et al. 2020), which means less than 3% of the total diversity of the ~2,550 recognized rodent species (based on Burgin et al. 2018). Most of these reports are concentrated in North America and Europe, with only eight cases documented in South America (Cademartori & Pacheco 1999; Ramirez & Arana 2005; Daz et al. 2015; Boher-Bentti et al. 2016; Romero et al. 2018; Ramirez et al. 2019; Stumpp et al. 2019; Dalapicolla et al. 2020). Even in Brazil, which is home to a diversity of 263 species in nine families of rodents (Abreu et al. 2021), there are only three records of this condition: two cricetids (Cademartori & Pacheco 1999; Stumpp et al. 2019) and one echimyid (Dalapicolla et al. 2020).

The family Caviidae Gray, 1821 is endemic to South America (Dunnum 2015), and its species present a body covered by non-spiky hairs, reduced or absent tail, and hind legs with three digits (Bezerra 2008). There are only two records of albino individuals in Caviidae, both for the genus *Cavia*: *C. porcellus* (Linnaeus, 1758) (Dunn 1921) and *C. tschudii* Fitzinger, 1867 (Ramirez et al. 2019). So far, there are no records for the genus *Galea*.

In this work we present the first record of albinism in Spix's yellow-toothed cavy *Galea spixii* (Wagler, 1831) from northeastern Brazil, a genus that generally inhabits areas of open formations of Cerrado and Caatinga, and shows cursorial habits (Vaughan 1972; Mares & Ojeda 1981; Daz 2000). This is an endemic species widely distributed throughout Brazil, with populations concentrated in the Northeastern Region, mainly in semi-arid Caatinga thorn scrub woodlands and disturbed areas with plantations (Dunnum 2015). It is classified as least concern by IUCN (Catzefflis et al. 2016). This is also the first record of this condition in a Brazilian caviid.

The albino specimen was found in a private property of Itaqui beach (latitude -2.90131; longitude -41.55909), municipality of Lus Correia, Piau State, Brazil (Fig. 1). This coastal region is inserted in an ecotone zone with dunes, mangroves, and typical phytophysionomy of Caatinga, Cerrado, and Restinga (coastal vegetation) with a predominance of shrub (40.86 %), herbaceous (31.18 %), and tree (15.05 %) species (Amaral & Lemos 2015). There are several residences, hotels, and inns in the surroundings, which are near the Environmental Protection Area of Delta do Parnaba.

On 5th May 2021, this albino adult individual of *G. spixii* was photographed together

with an individual bearing the common *G. spixii* pelage (Fig. 2). The individuals were in an open area with sandy substrate covered by herbaceous and grass vegetation typical from Restinga, such as *Blutaparon portulacoides* (A.St.-Hil.) Mers, *Elephantopus hirtiflorus* DC., *Heliotropium polyphyllum* Lehm., and *Commelina erecta* L. Local people frequently observed the specimen at least three months before, always together with regular-colored cavies. Spix's yellow-toothed cavy usually has soft hair with a pattern of color ranging from grayish gray to grayish brown, with a periocular ring with shorter hairs and lighter than on the back (Feijó & Langguth 2013). However, the individual here documented presented a total absence of pigmentation, including in the eyes (Fig. 2). It is important to emphasize that there are no other species of cavy distributed in this area of the northern coastal region of Brazil (Dunnum 2015), and no scientific records of interspecific social groups involving *Galea* or other Brazilian cavies. Thus, we do not consider the possibility of a misidentification.

The presence of an albino individual in a coastal area with little vegetation may be an indirect reflection of an inbreeding process in the population (Jannett 1981; Prado-Martinez et al. 2013). After all, the habitat is surrounded by human establishments (Fig. 1) and possibly disconnected from other populations. For the same reason, it is possible that this population of Spix's yellow-toothed cavy potentially suffers predation from domestic animals. In addition, this is one of the most preferred game species in the Northeast Region of Brazil (Alves et al. 2016). Thus, we consider the situation reported as exceptional under the observed conditions.

ACKNOWLEDGEMENTS

Tainá Cortes, Artur Fontenelle and Pousada Vila Itaqui, for the photographic records and reports of sightings prior to the one recorded. We acknowledge Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) for the financial support of Ana Karolina R. Almeida and Fernando Heberson Menezes.

LITERATURE CITED



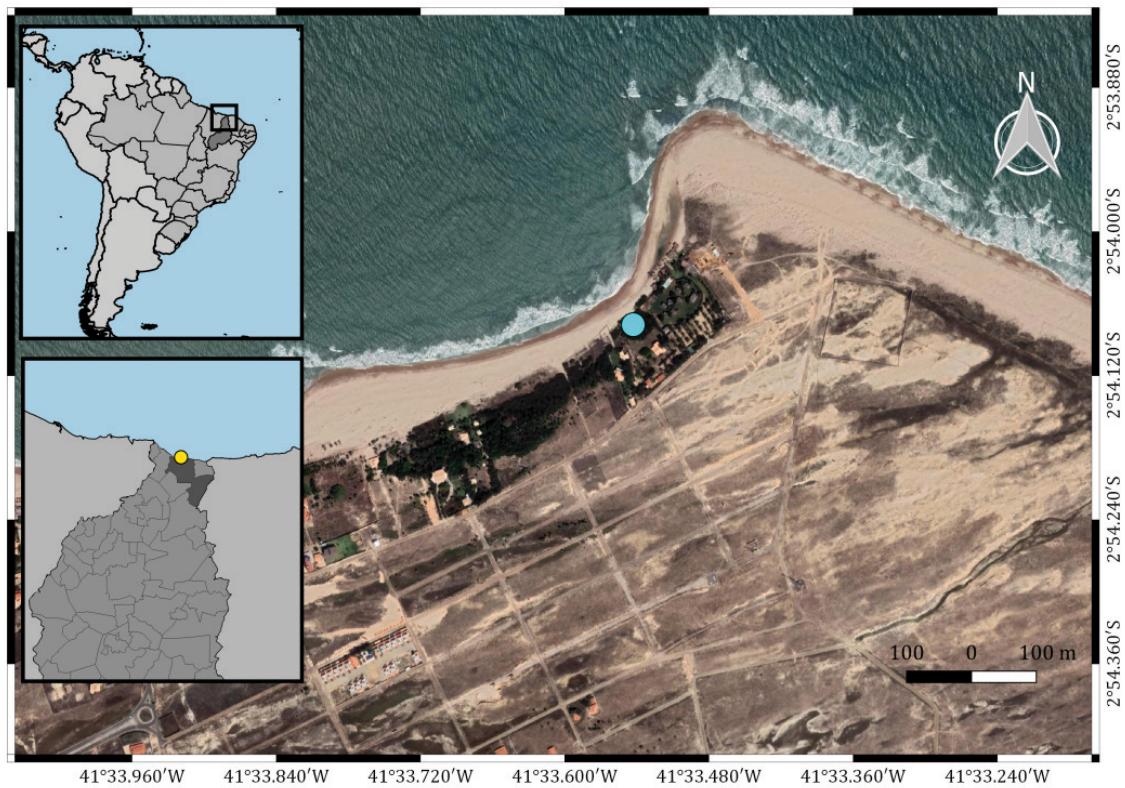


Figure 1. Study area in Luís Correia, Piauí state, Brazil. Yellow dot: Itaqui Beach location. Blue dot: location where the albino individual of *Galea spixii* was observed (Image created with QGIS 2.18.28, datum WGS84).



Figure 2. Individual of *Galea spixii* with albinism photographed next to an individual bearing the common *G. spixii* pelage in Luís Correia, Piauí state, Brazil (Photo by Artur Fontenelle).

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